DAF
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CONTRACT CO-0242 FINAL REPORT

PROJECT SUMMARY

REPORT DATE	PROJECT NAME	COMMENCEMENT DATE	EXPIRY DATE
30 June 2016	Support the delivery of the Reef Rescue Program in the Upper Herbert area by working with a Grazing Peer Group to develop Property Project Agreements targeting high risk areas for erosion	1-Dec-13	30-Jul-16

EXECUTIVE SUMMARY

This Reefsponsible project targeted the grazing industry in the Upper Herbert River catchment in North Queensland. The objective was to improve the quality of the water draining from district beef properties into the Great Barrier Reef. The district contains approximately 20 large grazing businesses (total area = 500 000 ha; total cattle = 75 000 head with 18 000 head annual sales) and over 60 smaller beef properties as well as dairy and mixed cropping enterprises. The project has worked with 16 large beef properties and numerous smaller holdings (total area =370 000 ha; total cattle = 50 000 head with 13 500 head annual sales) using a whole of business approach to facilitate improved grazing management and profitability.

Maintaining over 50% ground cover at the break of the season is the key management recommendation for reducing sediment loss across properties, particularly in riparian areas. Refining remote sensing technology to identify areas and properties with poor ground cover in this wet tropical region to target investment will play an important role into the future. Fixed monitoring points, used on six core properties to evaluate ground cover annually at the break of the season (November–December), recorded ground cover over 50% in all years on all properties despite on-going drought conditions. Improved grazing practices and ground cover management have been quickly adopted by 'younger generation' property managers when economic and environmental benefits are clearly evident.

The district contains numerous abandoned tin mine tailings dams that pose a serious threat to catchment water quality. During heavy wet seasons the old tailings dams overflow and discharge large quantities of fine suspended sediments. The Reefsponsible devolved grant projects included 18.2 km of riparian fencing and 17 off-stream waters across six properties and has resulted in grazing practise changes that would not have been implemented otherwise. The range of Reefsponsible projects, which also included wetland regeneration works, have improved grazing management practices and reduced sediment loss into the Herbert River catchments.

OVERVIEW OF PROJECT PROGRESS- 3 YEAR SUMMARY

Progress against planned activities and outcomes:

Results of monitoring of ground cover

Water sampling across the Upper Herbert River catchment over three wet seasons (2013–2015) identified sediment as being the only issue impacting on water quality from the upper catchment. To minimize sediment or soil loss into waterways, graziers should maintain effective ground cover over 50%, especially at the end of the dry season (November–January) when heavy rainfall events are likely. The first few big falls of rain at the beginning of the wet season are when the most soil movement

occurs, prior to the start of the pasture growth phase Producers must manage stocking rates and grazing pressure to ensure good ground cover is maintained, especially in riparian areas. Seventy seven monitoring points were installed across the district to visually estimate ground cover and these have been accessed and recorded at the end of the dry season each year. Ground cover levels were very good considering most properties in the district were drought declared in mid-2015. There were only several sites that recorded below the 50% ground cover levels and these were all on one property

Peer group established

A producer peer group of two well-respected graziers in the district was established to inspect all devolved grant projects on six properties. This was proved a strategic move as we had no trouble with producers finishing their projects to a high level. The issue is the lack of continuity, given the project finished in June 2016.

Case studies/articles produced, where and publication date if applicable

Two case studies on Glen Ruth and Wombinoo Stations have been submitted previously and the third and final case study on Goshen Station is included with this report (see Attachment 2). These case studies highlight what innovative producers are achieving and are used to promote improved management across the industry.

Summary of farm management changes made on each property

A continuing challenge in project work across the district is that some producers are not interested in being involved in natural resource management projects. These properties are not interested in sustainable grazing practices, yet are contributing to high sediment levels in local waterways. Mismatching cattle numbers to grass supply in our variable climate is not just a problem specific to the Upper Herbert catchment; it is an industry-wide issue.

A full list of farm management changes and on-property activities is given in Attachment 3.

Length of fencing completed for each property and watering points

Property Name	Length of Fencing (km)	Number of Watering Points Installed
Ben Avon	4.5	1
Millstream Holding (Fry)	5.0	3
Wombinoo	3.2	3
Tirrabella	1.5	8
Goshen	4.0	2

Area of streambank fenced from stock access

Property Name	Stream bank fenced (km)
Ben Avon	4.5
Millstream Holding (Fry)	5.0
Wombinoo	-
Tirrabella	1.5
Goshen	1.0

Successes, challenges and adaptations:

Successes

- The project team has successfully engaged with 16 of the 20 large properties in the Upper Herbert catchment. Five of these cattle businesses are being managed by young families who have readily accepted change and adopted new management practices, if economic and environmental benefits were obvious. These producers are now more aware of the role they can have in boosting productivity/profitability by improving grazing management and maintaining break of season ground cover to reduce soil loss that will benefit their business and minimize their impact on downstream water quality.

- Producers are thinking strategically in relation to their management and production systems (e.g. implementing changes to marketing, pasture improvement and herd management).
- Wet season spelling is being implemented across four larger breeding properties through spelling substantial areas for the whole wet season, and doing this annually. Our pasture monitoring work has shown that producers who wet season spell and don't overgraze have healthy and resilient pasture systems. These healthy pastures, which were overgrazed during the low rainfall years of 2014–2015, have recovered very well this wet season due to their strong perennial pasture base. This is in contrast to pastures overgrazed in most years, which have shown very poor recovery during the 2015/2016 wet season.
- Having access to a financial consultant to assist producers/beef businesses with a wide range of issues has been an outstanding success. It has highlighted numerous issues/weaknesses in the financial management and low financial literacy in the average family beef business. It has also highlighted some of the reasons for poor adoption of better management in the absence of a whole of business approach.

Challenges

- We recommend that devolved grants and on-ground projects should only be allocated for riparian fencing and subsequent off-stream waters. This will allow for well-managed grazing pressure in riparian zones, or ideally complete exclusion of cattle.
- Sediment-erosion hotspots that were identified went unrepaired as properties under financial pressure did not take part in the devolved grant process due to the rule of 50% of the funding required to be supplied from the landholder. A particular property with severe gully erosion on sodic soils (see Attachment 4) was left untreated because of the producer's financial difficulties.
- Ex-tin mining tailings dams identified are a major source of sediment in the catchment, particularly during a heavy wet season when they readily overflow into nearby watercourses. Major funds would be required to rectify these tailings dams, along with the on-property gullies referred to above.
- The Upper Herbert catchment has between 50 to 100 small landowners with fairly poor land and cattle management skills. They will be impacting on water quality as overgrazing on these small holdings is common. Engaging with these producers has been difficult and time consuming.

Adaptations

- It is difficult achieving whole of catchment reductions in sediment loss without implementing monitoring and/or improving grazing management across all properties. Currently, some producers (six large properties—120,000 ha—and many smaller properties around Ravenshoe/Herberton) are reluctant to be involved in any educational practices to improve grazing land ground cover management. A possible solution would be permanent monitoring points installed across all properties that could be assessed at any time by a third party. The results could form part of a lease condition report and link directly to stock reduction or the lease renewal process—all aimed at achieving improved ground cover, reduction in sediment loss and improved water quality.
- More R&D is needed to further develop spatial tools in relation to break of season ground cover/pasture yield accuracy in the Wet Tropics. Over the life of the project the satellite imagery and associated technologies have improved but the heavy tree layer and treeless black soil plains are still resulting in inaccurate assessments of ground cover.

ACHIEVEMENTS AGAINST DELIVERABLES FOR DEC 2015- JUL 2016

ACTIVITY	OUTPUT	ACHIEVEMENTS AGAINST DELIVERABLES
Establish 'Property Project Agreements' to assist with infrastructure and grazing changes to reduce the risk of sediment flowing into the GBR lagoon	• All documentation for completed projects submitted by 31 July 2016	All agreements in place and six on-ground grazing management projects in place and completed (all devolved grant final project reports/acquittals submitted in late 2015).
Deliver Beef team $avannaPlan-Beef$ense program on grazing properties to identify best practice business, herd and grazing management options	• Report annually on visits to properties and changes to management • Two on-property forums held annually	Annual reporting complete (see Attachment 3). The Savanna Plan-Beef$ense training package is the key whole of business approach that our team uses with producers. A booklet has been prepared (see Attachment 5) to explain what financial information is required from the business and what sort of feedback and advice can be given. PowerPoint presentations are also used to explain the importance of pasture management, stocking rates and ground cover on the productivity of their business and their subsequent impact on water quality (see Attachment 6). Over the last 12 months we have had three on-property forums and two workshops (see Attachment 7).
Raising public awareness of improved farming practices being done by beef producers to reduce environmental impacts	• Two articles featured in Beef Central and Northern Muster annually • Two documented success stories featuring key sediment, production and business outcomes • Produce one case study annually (written or video)	Five Northern Muster articles written over the last 12 months (see Attachment 8). Northern Muster articles rarely prompted any feedback from producers. Raising public awareness of improved management through mainstream press releases is challenging. Press releases were prepared by a Terrain Media Officer and sent out to the mainstream press, often only published after severe editing. An example is shown in Attachment 9, where an interesting article and photos were reduced to a small snippet in the Cairns Post. Eventually a local Tablelands paper produced a better article. Pending press releases that have been sent to the Terrain Media Officer are shown in Attachment 10. Attachment 11 shows the two success stories featuring key sediment, production and business outcomes. These stories have been submitted to Beef Central, but have yet to be published. Case study completed and submitted (see Attachment 2).
Provision of final report to Terrain	Shapefiles provided to Terrain 31 May 2016	All GIS coverages have been delivered to Deb Bass.

IMPLEMENTATION UPDATE

Several Information days were ran at the beginning of the project to inform all producers on the Upper Herbert of the project aims and devolved grants available. GIS and financial assistance staff were also introduced and gave presentations on how their expertise could contribute to property productivity.

Unfortunately the project coincided with several poor wet seasons and drought, coupled with some of the lowest cattle prices since the 1970s, and many properties were not in a position to take up the devolved grant process.

A number of producers didn't turn up or get involved in any on-property activities forums or workshops.

Social, environmental or economic outcomes of Reef grants

Six properties are now actively sharing information and grazing management experiences. The on-ground devolved grant projects are certainly addressing land and stocking rate management issues, with ground cover and sediment reduction outcomes being achieved. The grants have also allowed the project team to engage with several businesses that have been reluctant to be involved in the past. These properties have had younger generation family members take over the property management with positive results. The beef industry over the last three years has encountered difficult seasons and with cattle prices falling to a 30 year low, property incomes have been reduced by 50%; however, in spite of these challenges producers have continued to improve their grazing management practices. The grants have enabled on property projects that would have never been completed otherwise.

Influence of Reef Programme on attitudes of farmers towards water quality

There is little doubt the devolved grant process and Reefsponsible extension activities have kept reef health issues "front or mind" for producers. Good on property management that boosts beef productivity and profitability meshes in well with management that results in good water quality. How to get this key message across to all beef producers is a mystery.

Unexpected positive or negative outcomes of Reef grants

- Not all properties are involved and many land managers never seem to come to information days or want to be involved in programs like Reefsponsible.
- Follow up pasture monitoring and break of season ground cover won't be continued by the property owners in many cases due to labour pressures, but hopefully they will now be good pasture ground cover managers. The monitoring sites locations are recorded by GPS and can be re-visited in the future.
- Good case studies—useful resource for both local producers and those outside the region. Also a practical resource for agencies, agribusinesses and NRM stakeholders.

LESSONS LEARNT AND IMPROVEMENTS

This project has run for three years and allowed on-going support to motivated producers implementing resource management changes. Changing property layout and management doesn't happen overnight and the on-going support made possible by the Reefsponsible funding has produced tangible results.

Having an experienced delivery team is an important factor in gaining creditability. A team that can respond to questions across all aspects of a modern beef business, and having financial and GIS expertise available, is important.

With the end of the project in mid-2016, information sharing and formal get togethers to discuss relevant issues will be adhoc. Producers readily involved now have the knowledge to manage their country sustainably as a result of this project's mentoring and engagement approach.

The use of satellite imagery to identify sediment hot spots or chronic overgrazing in the Wet Tropics has not been satisfactorily achieved to date but the technology is improving with time. The thick timber cover over most of the Upper Herbert river catchment is causing the most issues.

FUTURE DIRECTION/ NEEDS

The "holy grail" of reducing soil loss for grazing land is maintaining good ground cover. Ground cover is managed by using good stocking rate decisions. Often these decisions are being managed poorly by some properties due to a number of factors, including: a highly variable climate impacting on annual grass supply; volatile cattle prices and changing market requirements; ever increasing costs of production; and the usual pressures/aspirations/needs experienced by family business with a fair debt burden. Also, many beef properties managers are ill equipped to handle the many facets of a modern beef business. The reasons above are causal as to why poor decisions and widespread overgrazing are impacting on water quality. Possible solutions on the way forward include:

- rewarding good land stewardship with an incentive scheme in the Wet Tropics region.
- improving satellite accessed technology to enable the identification of sediment hot spots and target funding to these areas
- providing on-going training and continuity of support services for beef producers
- allow third party inspection of fixed monitoring points for measuring ground cover and land condition.

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